8. Visualizing total lightning in the Aviation Weather Testbed and Aviation Weather Center

Brian P. Pettegrew
Colorado State University/CIRA and NOAA Aviation Weather Center, Kansas City, MO, USA

The Aviation Weather Center uses a combination of high resolution model data, surface and upper-air observations, radar, and lightning data to produce synoptic scale convective decision support and nowcasts, in the form of SIGMETs, to support enroute flight operations and air traffic planning. The primary source of operational lightning data has been a combination of cloud-to-ground observations over the U.S. detected from ground based sensors along with a limited domain of non-classified total lightning centered over the U.S. and a limited non-classified dataset of sferics covering portions of the eastern hemisphere.

Improvements to ground-based detection, along with increased data availability, and the launch of the GOES-R (GOES-16) Geostationary Lightning Mapper, will allow for greater coverage and usability of lightning data for both research and development and decision support at the AWC. The Aviation Weather Testbed (AWT) and AWC have ingested multiple ground-based global datasets with the purpose of exposing forecasters to a more precise product along with greater coverage for better forecasting and decision support. Additionally, the experimental data has allowed developers in AWT to evolve visualization, with feedback from the NOAA Total Lightning Working Group, which is constructed of meteorologists from NWS Forecasts Offices, National Centers, and multiple testbeds. These gridded visualizations have been evaluated by users in AWT summer experiments for both CONUS and global scale forecasters alike. Current versions of the CONUS total lightning density is now available to operational forecasters in decision support roles. Also, the AWT has looked at derivation of aviation specific variables to support the need for decision support. While this product has been introduced in the AWT, it has not been evaluated. Verification efforts and bias corrections are being done simultaneously to improve this product. This development will continue and transition along with the increased bandwidth of data made available by the GOES-16 Geostationary Lightning Mapper.